

CLAIMS

1. A TDMA radio communication system using a multiple sub-carrier modulation method, said TDMA radio communication system comprising at least a first and a second radio station, wherein

said second radio station selects only those sub-carriers capable of providing a transmission rate not less than a predetermined value in said first radio station, on the basis of the reception conditions of each sub-carrier of said first radio station, and modulates the selected sub-carriers using a modulation level or a coding rate in accordance with the reception conditions of said sub-carriers so as to perform communication.

2. A TDMA radio communication system using a multiple sub-carrier modulation method, said TDMA radio communication system comprising at least a first and a second radio station, wherein

said first radio station comprises: sub-carrier electric power detecting means for detecting the reception power of each sub-carrier; and notification means for notifying said second radio station of information on said reception power detected by said sub-carrier electric power detecting means, and

said second radio station comprises: determination means for determining whether a sub-carrier is capable of providing such a reception power as to enable communication at a transmission rate not less than a predetermined value in said first radio station, on the basis of the reception conditions of each sub-carrier sent from said first radio station; and transmission sub-carriers selecting means for selecting only those sub-carriers determined to be capable of enabling communication by said determination means, wherein the sub-carriers selected by said transmission sub-carriers selecting means are modulated using a modulation level or a coding rate in accordance with the reception condition of the sub-carriers in

order to perform communication.

3. A TDMA radio communication system using a multiple sub-carrier modulation method, said TDMA radio communication system comprising at least one base station and a terminal station that share the same frequency to perform communication, wherein

said terminal station comprises: notification means for notifying said base station of broadcast information on the reception power of sub-carriers, and

said base station comprises: broadcast information detecting means for detecting said broadcast information; sub-carrier electric power detecting means for detecting the reception power of each sub-carrier in accordance with said broadcast information; determination means for determining whether a sub-carrier is capable of providing such a reception power as to enable communication at a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception power detected by said sub-carrier electric power detecting means; and transmission sub-carrier selecting means for selecting only those sub-carriers determined to be capable of enabling communication by said determination means, wherein each sub-carriers selected by said transmission sub-carrier selecting means are modulated using a modulation level or a coding rate in accordance with the reception power in order to perform communication.

4. A TDMA radio communication system using a multiple sub-carrier modulation method, said TDMA radio communication system comprising at least one base station and a terminal station, wherein

said base station selects only those sub-carriers capable of providing such a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception conditions of each sub-carrier of said

terminal station, and modulates the selected sub-carriers using a modulation level or a coding rate allotted in accordance with the reception conditions of the selected sub-carriers and the position of said terminal station with respect to said base station so as to perform communication.

5. A TDMA radio communication system using a multiple sub-carrier modulation method, said TDMA radio communication system comprising at least one base station and a terminal station, wherein

said terminal station comprises: sub-carrier electric power detecting means for detecting the reception power of each sub-carrier; and notification means for notifying said base station of information on said reception power detected by said sub-carrier electric power detecting means, and

said base station comprises: determination means for determining whether a sub-carrier is capable of providing such a reception power as to enable communication at a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception conditions of each sub-carrier sent from said first terminal station; allotment means for allotting a modulation level or a coding rate in accordance with said reception conditions and the position of said terminal station with respect to said base station; and transmission sub-carrier selecting means for selecting only those sub-carriers determined to be capable of enabling communication by said determination means, said sub-carriers being transmitted using a modulation level or a coding rate allotted by said allotment means.

6. A TDMA radio communication system using a multiple sub-carrier modulation method, said TDMA radio communication system comprising at least one base station and a terminal station that share the same frequency to perform communication, wherein

said base station selects only those sub-carriers capable of providing

a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception conditions of each sub-carrier of said terminal station, and modulates the selected sub-carriers using a modulation level or a coding rate allotted in accordance with the reception conditions of the selected sub-carriers and the position of said terminal station with respect to said base station so as to perform communication.

7. A TDMA radio communication system using a multiple sub-carrier modulation method, said TDMA radio communication system comprising at least one base station and a terminal station that share the same frequency to perform communication, wherein

said terminal station comprises: notification means for notifying said base station of broadcast information on the reception power of sub-carriers, and

said base station comprises: broadcast information detecting means for detecting said broadcast information; sub-carrier electric power detecting means for detecting the reception power of each sub-carrier in accordance with said broadcast information; determination means for determining whether the sub-carrier is capable of providing such a reception power as to enable communication at a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception power detected by said sub-carrier electric power detecting means; allotment means for allotting a modulation level or a coding rate to each sub-carrier in accordance with said reception power and the position of said terminal station with respect to said base station; and transmission sub-carrier selecting means for selecting only those sub-carriers determined to be capable of enabling communication by said determination means, said sub-carriers being transmitted using a modulation level or a coding rate allotted by said allotment means.

8. The TDMA radio communication system according to claim 4, wherein a smaller modulation level or a coding rate is allotted to said terminal station in proportion as the distance increases between said base station and said terminal station.

9. The TDMA radio communication system according to claim 4, wherein said modulation level or said coding rate is allotted to said terminal station in each of a plurality of radio environment zones delimited on the basis of; the relationship between power of interference to peripheries caused by communication between said base station and said radio station and the distance between said base station and said radio station; and the relationship between electric power required for communication between said base station and said radio station and the distance between said base station and said radio station.

10. The TDMA radio communication system according to claim 4, wherein said base station further comprises calculation means for calculating a transmission rate, in accordance with said terminal station's position with respect to said base station in a first cell area, such that interference power to a second cell area is not more than a predetermined value, said second cell area being different from said first cell area wherein said base station performs communication with said terminal station and in which second cell area another base station different from said base station and a terminal station perform communication.

11. The TDMA radio communication system according to claim 4, wherein said TDMA radio communication system further comprises memory means for storing information on each received sub-carrier ranked on the basis of the reception power, and wherein transmission is performed in descending

order of reception power in accordance with the ranking.

12. The TDMA radio communication system according to claim 11, wherein transmission is performed in descending order of the modulation level or the coding rate.

13. The TDMA radio communication system according to claim 1, further comprising an output adjusting circuit for adjusting the transmission power value on individual received each sub-carrier unit basis.

14. The TDMA radio communication system according to claim 1, wherein said transmission rate not less than said predetermined value is a maximum transmission rate.

15. A TDMA radio communication system, wherein in the case where one of radio stations, such as a base station, for example, supports a plurality of transmission rates not less than the transmission rate of a terminal station that is set, said base station controls multiple transmission rates for individual sub-carriers in accordance with the reception conditions of each sub-carrier returned from said terminal station, using a greater number of types of modulation methods or coding rates not less than is set.

16. A TDMA radio communication system, wherein a maximum transmission rate supported by a radio station and a desired reception power are transmitted from one communication device to another communication device.

17. A second radio station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least a

first radio station and said second radio station, wherein

said second radio station selects only those sub-carriers capable of providing a transmission rate not less than a predetermined value in said first radio station, on the basis of the reception conditions of each sub-carrier of said first radio station, and modulates the selected sub-carriers using a modulation level or a coding rate in accordance with the reception conditions of the selected sub-carriers so as to perform communication.

18. A first radio station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least said first radio station and a second radio station, said first radio station comprising sub-carrier electric power detection means for detecting the reception power of each sub-carrier, and notification means for notifying said second radio station of information on said reception power detected by said sub-carrier electric power detecting means.

19. A second radio station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least a first radio station and said second radio station, said second radio comprising determination means for determining whether a sub-carrier is capable of providing such a reception power as to enable communication at a transmission rate not less than a predetermined value in said first radio station, on the basis of the reception conditions of each sub-carrier sent from said first terminal station, and transmission sub-carrier selecting means for selecting only those sub-carriers determined to be capable of enabling communication by said determination means, wherein the sub-carriers selected by said transmission sub-carrier selecting means are modulated using a modulation level or a coding rate in accordance with the reception conditions of said sub-carriers in order to perform communication.

20. A base station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least one base station and a terminal station that share the same frequency to perform communication, wherein said base station comprises: sub-carrier electric power detecting means for detecting the reception power of each sub-carrier; and determination means for determining whether a sub-carrier is capable of providing such a reception power as to enable communication at a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception power detected by said sub-carrier electric power detecting means, wherein each sub-carrier selected by said transmission sub-carrier selecting means is modulated using a modulation level or a coding rate in accordance with the reception power of the sub-carrier in order to perform communication.

21. A base station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least one base station and a terminal station, wherein said base station selects only those sub-carriers capable of providing a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception conditions of each sub-carrier of said terminal station, and modulates the selected sub-carriers using a modulation level or a coding rate allotted in accordance with the reception conditions of the selected sub-carriers and the position of said terminal station with respect to said base station so as to perform communication.

22. A terminal station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least one base station and a terminal station, wherein said terminal station comprises

sub-carrier electric power detecting means for detecting the reception power of each sub-carrier, and notification means for notifying said base station of information on said reception power detected by said sub-carrier electric power detecting means.

23. A base station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least one base station and a terminal station, wherein said base station comprises: determination means for determining whether a sub-carrier is capable of providing such a reception power as to enable communication at a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception conditions of each sub-carrier sent from said terminal station; allotment means for allotting a modulation level or a coding rate in accordance with said reception conditions and the position of said terminal station with respect to said base station; and transmission sub-carrier selecting means for selecting only those sub-carriers determined to be capable of enabling communication by said determination means, said sub-carriers being transmitted using a modulation level or a coding rate allotted by said allotment means.

24. A base station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least one base station and a terminal station that share the same frequency to perform communication, wherein said base station selects only those sub-carriers capable of providing a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception conditions of each sub-carrier of said terminal station, and modulates the selected sub-carriers using a modulation level or a coding rate allotted in accordance with the reception conditions of the selected sub-carriers and the position of said

terminal station with respect to said base station so as to perform communication.

25. A base station suitable for a TDMA radio communication system using a multiple sub-carrier modulation method and comprising at least one base station and a terminal station that share the same frequency to perform communication, wherein said base station comprises: sub-carrier electric power detecting means for detecting the reception power of each sub-carrier; determination means for determining whether a sub-carrier is capable of providing such a reception power as to enable communication at a transmission rate not less than a predetermined value in said terminal station, on the basis of the reception power detected by said sub-carrier electric power detecting means; allotment means for allotting a modulation level or a coding rate to each sub-carrier in accordance with said reception power and the position of said terminal station with respect to said base station; and transmission sub-carrier selecting means for selecting only those sub-carriers determined to be capable of enabling communication by said determination means, said sub-carriers being transmitted using a modulation level or a coding rate allotted by said allotment means.